U.S. Department of the Treasury
Financial Management Service

The FMS Electronic Data Interchange Guidebook

August 30, 1996

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1. EXECUTIVE SUMMARY

Public and private sector organizations have traditionally conducted business using paper documents and preprinted forms to exchange information with each other. These documents were sent by mail and manually processed by the recipient. Over the years, the number of these paper-based exchanges, and the amount of associated data, increased dramatically, forcing organizations to seek a more expedient way of communicating and processing business data.

Electronic Data Interchange (EDI) emerged in the late 1960's when industry groups such as railroads, airlines, motor carriers, and shipping companies realized that processing the large volume of paper documentation accompanying the shipment of goods resulted in significant delays in settlement and product deliveries. Since then, companies in industries of all kinds have found that EDI makes economic sense. The Data Interchange Standards Association (DISA) estimates that more than 15,000 companies around the world currently conduct business using EDI. The list of industries in which EDI is actively used includes shipping, retail, grocery, apparel manufacturing and textiles, warehousing, aerospace, chemicals, construction, automotive, financial, electrical and electronics, utilities, health care, petroleum, pharmaceutical, metals, paper, entertainment, and higher education. This list continues to grow and, in recent years, Federal, state, and local governments have begun to conduct business electronically as well.

This guidebook presents a methodology for planning and implementing EDI-based systems, and contains information on relevant functional and technical topics, including software, networks, financial EDI, procurement, and trading partner strategy. It is intended for use by Federal agencies, particularly smaller civilian agencies.

This section presents an executive summary of the following topics:

- Definitions of Electronic Data Interchange (EDI) and Electronic Commerce (EC)
- Components of an EDI system
- EDI and EC in the Federal government
- The use of EDI in different functional areas, including procurement, financial applications, and credit management
- Trading partner strategy
- Planning an EDI implementation
- Implementing an EDI pilot
- Conducting Cost/Benefit Analyses for EDI applications

These subjects are discussed in greater detail in the remainder of the guidebook.

1.1. DEFINITION OF ELECTRONIC DATA INTERCHANGE (EDI) AND ELECTRONIC COMMERCE (EC)

EDI is defined as:

> *"The electronic exchange of business documents (purchase orders, invoices, application forms, etc.) from one organization's computer to another organization's computer in standard data formats."*

EDI is based on a set of standard formats that define transaction sets (or messages) that can be used to send basic business data from one computer to another. These transaction sets replace paper documents such as purchase orders, invoices, and bills of lading.

EC is defined as:

> *"The paperless exchange of business information using Electronic Data Interchange (EDI), electronic mail (E-mail), computer bulletin boards, facsimile (fax), Electronic Funds Transfer (EFT), and other similar technologies in the process of government acquisition including the procurement of and payment for supplies and services."*

EDI and EC help organizations and their trading partners become more efficient and improve client service. Some of the benefits of EDI include speed of exchanging data, elimination of manually performed tasks, reduction in costs, and the availability of resources that were previously dedicated to the manual processing of paper-based documents.

1.2. COMPONENTS OF AN EDI SYSTEM

The four main components of an EDI system are:

- **EDI Standards**: EDI is based on a set of standard formats that define transaction sets that can be used to exchange business documents between organizations. The standards eliminate the need for human intervention in the interpretation of incoming and outgoing data. Today, there are primarily two sets of standards used by organizations to perform EDI - the American National Standards Institute, Accredited Standards Committee (ANSI ASC) X12 standard and the United Nations EDI for Administration, Commerce, and Trade (UN/EDIFACT)

standard. Organizations may customize these standards within certain guideline and develop their own Implementation Conventions.

- **Application Systems:** Application systems process the data to be sent to or received from trading partners. Such systems include an agency's procurement, receiving, and financial management systems, and the vendor's order management system.

- **EDI Gateway**: The EDI gateway converts application system data into a standard format and sends and receives messages to and from trading partners. A typical EDI gateway consists of a computer hardware platform and EDI translation software that maps, translates, and communicates data to trading partners. There are many Commercial Off The Shelf (COTS) EDI translation software packages available today, and organizations generally evaluate the packages and select one that meets their needs.

- **Communication Network**: A communication network is used in EDI to electronically transmit standard business documents between trading partners. Communication network options for EDI messages include commercial Value Added Networks (VANs), Value Added Services (VASs), the Federal Acquisition Computer Network (FACNET), the Internet, and point-to-point communications. As with software packages, organizations evaluate the available options and select one that meets their technical and functional needs.

1.3. EDI AND EC IN THE FEDERAL GOVERNMENT

In 1993, President Clinton issued a memorandum that mandated the use of EDI and EC in the Federal acquisition process. This action caused the beginning of the movement towards EDI implementation in the Federal government. The Federal Acquisition Streamlining Act (FASA), passed in 1994, contained several reforms to the current Federal acquisition process. It used a "carrot and stick" approach to the implementation of EC in that it raised the threshold for small purchases from $25,000 to $100,000 for Federal agencies that implemented EDI, as opposed to $50,000 for agencies that did not. FASA offers Federal agencies the potential to realize significant cost savings in their procurement function. As a result, many agencies started implementing EDI-based procurement applications.

The Federal Acquisition Reform Act (FARA), passed into law in 1996, raises the threshold for simplified acquisitions to $100,000 for all agencies until December 31, 1999; after this date the limit will be dropped to $50,000 for agencies that have not implemented EDI programs. While FARA has removed the element of urgency for the immediate implementation of EDI in the Federal government, most agencies have realized that EDI offers an excellent opportunity to reduce costs and streamline their procurement process, and they are continuing their efforts to implement this technology.

1.4. THE USE OF EDI IN DIFFERENT FUNCTIONAL AREAS

There are many functional areas in which EDI can be used to increase efficiency and reduce processing costs. This document examines three functions - procurement, financial applications, and guaranteed loan management - for the potential use of EDI.

1.4.1 PROCUREMENT

In the Federal government, EDI and EFT are most widely used in the process of procuring goods and services and paying for them. The use of EC for all small purchases was mandated by FASA, and later modified by FARA until 1999. However, many agencies have realized that EC is efficient and cost effective, and are therefore, continuing their efforts to implement EDI-based programs. While FACNET and Central Contractor Registration (CCR) are operational at this point in time, their use to date has been limited, and agencies are trying to determine how they will be utilized and administered in the future.

In addition, there are a number of new initiatives in the Federal procurement function, including:

- **GSA Advantage!:** GSA has set up a new EDI-based system called GSA Advantage!, which uses both FACNET and the Internet for communications. Vendors can place their price lists on this system, and agencies can browse through the products and place orders directly with the vendor using traditional ordering methods or credit cards, or can place orders through GSA.

- **Interational Merchants Purchase Action Cards (IMPAC):** The Federal government is promoting the use of government credit cards, known as IMPAC, for micro purchases under $2,500 in value. EDI may be used for receiving statements from and making payments to credit card companies.

In implementing EC, Federal agencies have found that small PC-based EDI gateways and a combination of network options provide the optimum functionality. FACNET can be used for RFQs that need to be broadcast to a large number of vendors, VANs are most effective for direct communications with individual vendors, and the Internet is a good source for product and vendor information.

1.4.2 FINANCIAL APPLICATIONS

Electronic Funds Transfer (EFT) has traditionally been used to move money electronically between parties doing business together. However, it is very cumbersome to move remittance data through EFT, and paper-based methods have to be used instead, causing reconciliation problems for the payee. Financial EDI which is defined as “the movement of payments and payment related information via EDI” allows organizations to move funds and data together through the banking system using the ANSI ASC X12 820, Payment Order/Remittance Advice, transaction set and the ACH CTX, Corporate Trade Exchange, format.

The Department of the Treasury, Financial Management Service (FMS) has developed a

number of EDI and EFT-based systems for the agencies that FMS collects and disburses funds for. Some of these initiatives are described below:

- **Vendor Express:** Vendor Express is a payment program that allows agencies to make electronic payments with accompanying data to companies and individuals. It utilizes both the Case Concentration or Disbursement Plus Addenda (CCD+) (one payment/one invoice) and the CTX (one payment/many invoices) ACH formats and specifications for the ANSI X12 820 Payment Order/Remittance Advice.

- **Automated Standard Application for Payments (ASAP):** ASAP is an all-electronic payment and information system that allows recipients of Federal assistance to electronically request and receive pre-authorized funds through the U.S. Treasury.

- **Remittance Express (REX):** REX is an electronic funds transfer system that allows Federal agencies to use the ACH network to receive payments from the public.

- **Electronic and ACH-only Lockboxes:** Electronic and ACH-only lockbox operators automatically collect and deposit payments received from the public into Treasury's account at the Federal Reserve Bank. The deposit data is available to the agency through via FMS's CA$H-LINK system.

- **Direct Payment/Recurring Pre-Authorized Debits (PAD):** PAD is an electronic transfer of funds authorized in advance by the remitter, and initiated by the agency.

1.4.3 CREDIT MANAGEMENT

Several Federal agencies offer government guaranteed and direct loan programs to the public, including the Department of Veteran's Affairs, Department of Housing and Urban Development, and the Small Business Administration. The process of loan management involves several phases, and EDI and EFT can be used to increase the efficiency and control, and reduce the cost of each phase of loan management, as described below:

- **Lender Management:** This phase includes those functions necessary to certify and monitor lenders. EDI can be used to collect lender data and share it amongst the credit-granting agencies.

- **Loan Origination:** This phase includes the functions necessary to process, evaluate, and approve loan applications. Agencies can use EDI to collect loan application data in a fast, accurate, and efficient manner, and financial EDI may be used to expedite the receipt and deposit of guarantee fees.

- **Loan Servicing:** This phase includes functions required to service loans and monitor the performance of loan portfolios. Credit-granting agencies can effectively use EDI to collect status information on loans and to track defaulted loans.

- **Debt Collection:** This phase includes functions required to process claims and assignments, and perform other related collection tasks. Lenders can use EDI to send claim notices, and agencies can settle claims quickly and efficiently using EFT.

1.5. TRADING PARTNER STRATEGY

The success of an organization's EDI efforts is ultimately determined by the level of participation of its trading partners. Therefore, the recruitment of trading partners should be an integral part of the EDI implementation strategy. In preparation for implementing an EDI application, an organization should formulate a cohesive trading partner strategy that addresses, at a minimum, the following items:

- **Stratification of Trading Partners:** Stratification, or grouping, of trading partners assists in determining the order in which trading partners should be implemented on the new EDI application. Agencies should establish a timeframe for implementation trading partners and criteria for stratifying trading partners. Commonly used criteria include transaction volume, the technical sophistication of trading partners, and their ability and willingness to participate in an EDI program.

- **Trading Partner Outreach Program:** Agencies should develop a comprehensive outreach program to contact their trading partners and persuade them to implement the EDI application. The outreach program should include the following activities:

  Establishing an Outreach Team that will be responsible for recruiting and implementing trading partners.

  Providing assistance to trading partners in implementing the EDI application. Such assistance may include Trading Partner Kits with informational and educational materials, providing incentives such as free or inexpensive software and network services, help desk services for troubleshooting, and training in the form of trading partner conferences.

- **Trading Partner Registration:** Agencies should establish procedures for registering trading partners, including the exchange of the ANSI X12 838, Trading Partner Profile, transaction set, and CCR, if necessary.

Agencies should also establish a detailed step-by-step procedure that will be followed by the Outreach Team when contacting, recruiting, and implementing trading partners.

1.6. PLANNING AN EDI IMPLEMENTATION

Planning is a key to success in implementing an EDI application. It provides the

implementation team with a sound basis for the functional and technical design of the new application, as well as a clearly defined plan for its implementation. The planning phase of an EDI application consists of the following activities:

- Analyzing the current process
- Developing workflows for the EDI application
- Developing an EDI implementation plan

1.7. IMPLEMENTING AN EDI PILOT

Pilot EDI programs usually involve converting a small number (5 to 10) of trading partners to an EDI application with 1 or 2 transaction sets for a brief period of time (3 to 6 months). Pilot applications provide agencies with valuable technical knowledge and expertise and can be used to demonstrate the benefits of the EDI application. Implementing a pilot ED application involves the following steps:

1. Establish a project team
2. Determine functions to be included in the pilot
3. Redesign the process
4. Recruit pilot trading partners
5. Define pilot technical architecture
6. Acquire and install hardware and software
7. Arrange for network services
8. Build interfaces to in-house application systems
9. Train users and trading partners
10. Test pilot system
11. Implement pilot system
12. Evaluate pilot system

1.8. COST/BENEFIT ANALYSES FOR EDI APPLICATIONS

Cost/Benefit Analysis is a method of identifying and analyzing the net financial costs, cost savings, and benefits associated with changing a process or program. The primary purpose of a Cost/Benefit Analysis is to compare the cost of maintaining the current process to the initial investment and ongoing costs necessary to modify or replace that process, and determine whether the implementation of the modified or new process or system will be cost effective.

- **Costs:** Costs are additional expenditures, cash outlays, or losses that arise as a result of changing the current process or program. Some of the key cost categories that should be considered when implementing EDI-based applications are:

Hardware for the EDI gateway
Software (EDI translation software, communications software, etc.)
Cost of modifying current application systems
Telecommunications (VAN) charges
Trading partner outreach program costs
Ongoing support and maintenance costs

- **Cost Savings:** Cost savings are reductions in expenditures, cash outlays or losses that result from changing a current process or program. Some of the cost savings typically associated with the implementation of EDI-based applications are:

  Savings in labor costs (through the elimination of data entry, paper document handling, reconciliation and other manually performed tasks)
  Elimination of mailing costs
  Reduction of document management costs (on site and off site storage)

- **Benefits:** Benefits are advantages gained as a result of changes to the current process or program. Benefits may be quantifiable or non-quantifiable, and include:

  Reduction in data entry error rates
  Improved cash management, including increased interest from reduced cycle time for receiving payments electronically
  Elimination of communication lag time between agency and customer
  Improved customer service
  Expandability of the system to other functions (Using the same translation software for various applications such as procurement, collections, payments, etc.)

Agencies should use a structured methodology to collect and analyze the costs, cost savings and benefits of implementing an EDI application. Automated spreadsheet models may be used to analyze and present the results of the Cost/Benefit Analysis, which should include a Net Present Value Analysis and a Breakeven Analysis.